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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,455	07/07/2003	Hwa-Seok Oh	8021-159 (SS-16950-US)	7509
22150 7590 02/06/2008 F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			EXAMINER SUN, SCOTT C	
			ART UNIT 2182	PAPER NUMBER
			MAIL DATE 02/06/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/614,455	OH, HWA-SEOK	
	Examiner	Art Unit	
	Scott Sun	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-14, 22-24 and 28 is/are rejected.
- 7) ☒ Claim(s) 1-4, 15-21 and 25-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 4/4/2007, with respect to rejection of claims 3, 4, and 14 under 35 U.S.C. 112 have been fully considered and are persuasive. The rejection has been withdrawn.
2. Applicant's arguments with respect to rejection of claim 4 under 35 U.S.C. 102 have been fully considered and are persuasive. The rejection has been withdrawn.
3. Applicant's arguments with respect to rejection of claims 1, 15, 18, and 20 under 35 U.S.C. 103 have been fully considered and are persuasive. The rejection has been withdrawn.
4. Applicant's arguments with respect to rejection of claims 6, 8, 9, 11, 12, and 22 have been fully considered but they are not persuasive. Applicant's arguments are summarized as:
 - a. Regarding claim 12, prior art of record does not teach a type field, "wherein the type field includes information on the type of data of the received data frames".
 - b. Regarding claim 9, prior art of record does not teach "determining whether the protocol field is identical to a predetermined protocol field", and generating an interrupt.
5. In response to argument 'a', examiner notes that an "end of data flag" would determine if a particular frame is a last packet, which contains data specific to end of a

transmission. Therefore, the end of data flag qualifies as information on the type of data of the received data frames.

6. In response to argument 'b', examiner notes that determining if the protocol field is equal to a value is logically analogous to determining if the protocol field is not equal to a value. Having the teachings from Bennett to check the when the protocol field is not equal to a value, would have made it an obvious design choice for a person of ordinary skill in the art to check when the protocol field is equal to a value. So although Bennett does not explicitly teach the limitation, it would have been an obvious variation of Bennett's teachings.

7. Having responded to each of applicant's arguments, examiner notes that prior art of record still provide a valid ground of rejection for claims 6, 8, 9, 11, 12, and 22. Slight changes are made in response to the claim amendments.

Claim Objections

8. Claims 1-4, 15-21, 25-27 are objected to because of the following informalities:

9. Regarding claim 4, the claim recites "a packet time delay" and subsequently, "the packet delay time". It is not clear that the two are equivalent. Examiner suggests amending the claim to recite "the packet time delay" to provide consistency and clarity to the claim language.

10. Regarding claims 1, 4, 15, 18, and 20, it is unclear what is meant by "a time interval between received data frames and excludes times of the data frames".

Examiner suggests amending the claims to recite "a time interval between reception

times of two data frames, and said time interval excludes processing times of the data frames". This would clearly state the meaning of the claimed time interval and the differences, as stated in the arguments, between the claim language and that of the prior art (first threshold of packet timer 84 taught by Connor).

11. Claims 2, 3, 16, 17, 19, 21, 25-27 are objected to because of their dependency on the above claims.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 11 is rejected as being obvious over Connor (PG Pub # US 2003/0061426, hereinafter), in view of Bennett et al (US 6,345,302, hereinafter Bennett).

14. Regarding claim 11, Connor discloses a method (figure 4) of generating interrupts of a network interface card which transceives data, the method comprising:

- receiving data frames (step 405, paragraph 28);
- generating an interrupt (step 435);
- stopping operations and transmitting the received data frames (step 430, 435, paragraph 22);

Connor does not disclose explicitly generating an interrupt based on determination of the protocol field. However, Bennett discloses determining whether the protocol field (protocol field) of the received data frames is identical to a predetermined protocol field (TCP, UDP, figure 15); and generating an interrupt if the protocol field is identical to the predetermined protocol field (column 14, lines 25-30); receiving a new data frame and going back to step b (loop back to beginning). Teachings of Connor and Bennett are from analogous art of network interfaces, and specifically to packet processing.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's with Bennett's teachings by generating interrupts using the protocol field disclosed by Bennett into the system of Connor for the benefit of efficiently operating protocol in a computer network (summary of invention, first paragraph).

15. Claims 12-14 are rejected as being obvious over Connor, in view of Satran et al (PG Pub # US 2002/0029305, hereinafter, Satran), Gentry Jr. et al (US 6,467,008, hereinafter Gentry), and Bennett et al (US 6,345,302).

16. Regarding claim 12, Connor discloses a method (figure 4) of generating interrupts of a network interface card which transceives data, the method comprising:

- determining a second time delay in response to the received data frames;
- determining whether the second time delay has passed and generating the interrupt if the second time delay has passed;

stopping operations of determining the second time delay in response to the generated interrupt and transmitting the received data frames;

stopping operations of determining the first time delay in response to the generated interrupt and transmitting the received data frames; and

receiving a new data frame and going back to estimating a first time delay (see 102 rejection for claim 4 above for specific teachings and examiner's arguments).

Connor further discloses determining a first time delay (figure 4, absolute timer); determining whether the first time delay has passed and generating an interrupt if the first time delay has passed (figure 4, step 426);

Connor does not teach explicitly counting number of data frames. However, Gentry discloses counting a number of data frames (figure 1, packet counter); and generating an interrupt if the number of received data frames is equal to N (figure 1, packet threshold, element 126, 128, 132; column 10, lines 45-53); Teachings of Gentry and Connor are from analogous art of network interfaces and specifically of interrupt handling.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's invention with Gentry's teachings by adding the packet counting circuits into the network interface in the system disclosed by Connor for the benefit of further reducing number of interrupts without preventing packets from being processed in a timely manner (column 3, lines 6-10)

Connor and Gentry combined does not teach explicitly determining a type field. However, Satran discloses determining whether the type field (last packet flag in the

header) of the received data frames is identical to a predetermined type field (flag indicating last packet, paragraph 35, 36, figure 3) and generating an interrupt if the type field is identical to the predetermined type field (paragraph 36, figure 3). Teachings of Connor, Gentry, and Satran are from analogous art of network interfaces, and specifically of interrupt handling.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's and Gentry's teachings as above and further with Satran's teaching by adding circuitry or logic that recognizes a field in the packet header to recognize last packet of transmissions into the combined system of Connor and Gentry for the benefit of minimizing interrupts in determining when a transaction using RDMA has completed (paragraph 13).

Connor, Gentry, and Satran combined does not disclose explicitly determining the protocol field. However, Bennett discloses determining whether the protocol field (protocol field) of the received data frames is identical to a predetermined protocol field (TCP, UDP, figure 15); and generating an interrupt if the protocol field is identical to the predetermined protocol field (column 14, lines 25-30). Teachings of Connor, Gentry, Satran, and Bennett are from analogous art of network interfaces, and specifically to packet processing.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's, Gentry's and Satran's teachings as above and further with Bennett's teachings by adding the protocol logic circuitry disclosed by Bennett into the combined system of Connor, Gentry and Satran for the benefit of

efficiently operating protocol in a computer network (summary of invention, first paragraph).

The examiner also makes the following assertions regarding rejection of the above claim. A person of ordinary skill in the art in light of the combination of Connor, Gentry, Satran and Bennet's teachings can readily envision an order of checking each of the tests, such as the order disclosed by the applicant (first delay, then count of frames, then second delay, then type, and finally protocol).

17. Regarding claim 13, Connor, Gentry, Satran, and Bennett combined disclose the method of claim 12, wherein Connor further discloses the first time delay starts from when a first data frame is received (figure 4, step 415).

18. Regarding claim 14, Connor, Gentry, Satran, and Bennett combined disclose the method of claim 12, wherein Connor further discloses the second time delay is a time interval between the received data frames (paragraph 26, figure 6).

19. Regarding claims 6-10, 22-24, and 28, examiner notes that the any one or more of the various techniques for generating an interrupt disclosed in teachings of Gentry, Satran, and Bennet can also be combined with Connor's teachings for the reasons given in rejection of claim 12. The following rejections are made in light of this assertion.

20. Claims 6-7 are rejected as being obvious over Connor in view of Gentry and Satran. These claims contain a subset of elements found in claim 12 and are rejected using the same reasoning as above.

21. Claim 8 is rejected as being obvious over Connor in view of Satran. This claim contains a subset of elements found in claim 12 and is rejected using the same reasoning as above.

22. Claims 9-10 are rejected as being obvious over Connor in view of Gentry and Bennet. These claims contain a subset of elements found in claim 12 and are rejected using the same arguments as above.

23. Claims 22-24, and 28 differ from claims 12-14 only in statutory category, containing substantially the same limitations. Therefore the same arguments used.

24. Further regarding claim 28, the examiner asserts in addition to the systems disclosed by the references cited above, hardware implementations of handling interrupts in network adaptors are well known in the art. Bennett further mentions the motivation for this approach would be to alleviate the need for the main computer processor to handle multiple interrupts (column 1, lines 60-63).

Conclusion

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on Mon-Thu, 10:00am-8pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Tsai can be reached on (571) 272-4176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 2/2/08
HENRY TSAI
SUPERVISORY PATENT EXAMINER